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Country Roads.

DURING the autumn which has just passed a correspondent of the *Hazleton* (Pennsylvania) *Plain Speaker* gave a description of a typical country road which attracted much attention. The road in question climbed slowly up a mountain with a grade which made drainage perfectly easy. In the County of Luzerne conglomerate rock and red shale abound and furnish such good material to pack hard under travel that there is no excuse for anything less than a smooth wheelway. And yet it was said that the road was rendered almost impassable in October by half liquid mud, in which the wheels of a light wagon sank to the depth of eight inches. This was not because the road had been left to itself, but because it had been laboriously repaired with cart-loads of black mould and clay scooped out from the road-side and shoveled upon the track. Of course, the road-bed became a continuous mass of mud after every rain and a stretch of blinding dust in every dry time, and as cold weather comes it will freeze into iron ridges, and nothing but the merciful snow will cover up its iniquities. Unfortunately, there is nothing singular about this Pennsylvania highway. All through the United States our people drive through mud and dust, to their discomfort, a great portion of the year; and yet the annual cost of repairing vehicles, added to the value of time wasted and the expense of extra horse power used in hauling loads, would give us, as a rule, passable highways.

Now a road that is permanently good must be properly made to begin with, and in the second place proper measures must be taken to keep it in constant repair. But no such attention has been given to the construction or maintenance of one mile in a thousand of our ordinary country roads. There was originally some excuse for this. The first roads were built when the country was thinly settled and anything like the expense necessary for a well constructed bed with adequate drainage was not to be thought of. Perhaps, too, the old plan of mending the roads, under which the farmers of a district assembled with hoes and shovels to do their road-mending all at once for the entire year was a most natural and economical plan. But in the older settled portions of our country, where the population is no longer scattered, no reasonable excuse remains for making a poor road or for tolerating improper road-mending.

It is encouraging to find that public opinion is making strenuous demands for reform in this direction, and in addition to improved road laws which were passed in half a dozen states last winter, we may probably hope for still more effective legislation in twice as many states at the next meeting of their Legislatures. Without stating here any of the fundamental principles which should govern the construction of roads, it is plain that such work should only be done by experts trained to the profession. The roads which have been famous for generations were built by engineers on scientific principles, and the fact that in several of our agricultural colleges a course of road-engineering is obligatory indicates a hopeful direction in current thought. The fact, too, that in so many states the old district system has been abandoned, and that skilled officers have been appointed to take charge of the roads of an entire district, is certainly a great step forward; and this, with the available machinery at command, which is multiplying in every part of the country, and the inspiring example which every mile of good road exerts on its vicinity, makes it probable that our improvement in this matter will be more rapid than we dared to hope a few years ago.

In the state of Pennsylvania this road question has been a matter of such special agitation that a legislative commission has been examining the subject in all parts of the state, and they have practically agreed upon an act to be introduced at the approaching session of the Legislature. By the terms of this act three commissioners will be selected in each township who will have the power to appoint and pay road-masters. Farmers who choose to work out their taxes must notify these commissioners before the 13th of April; they will not be allowed to work at their convenience, however, but will be required to report at such times and places as are designated by the road-masters, and on failure to comply with these terms their tax will become payable in cash. This to a certain extent puts road-construction and road-mending under something like expert control. The next provision of the act is that in addition to the annual mending of the roads a certain portion of the money collected for this purpose shall be set aside for permanent improvement. Wherever one mile in a township has received such thorough construction, that is, wherever the road has been built on a stone or gravel foundation with a covering of such metal as is approved by the county engineer, the county will be required to build an additional mile of permanent road in the same township, and the state will be required to construct another mile. The Attorney-General of the state announces that there is no legal objection to the appropriation of state funds to the permanent improvement of roads, and it is plain that local enterprise will thus be encouraged. The state authorities with those of the county and of the township will be placed in competition, and there is no reason to doubt that the miles of good road in the state will be rapidly multiplied.

Meanwhile, in order to increase the general knowledge on this subject, the University of Pennsylvania has offered a prize of $500 for essays on road-construction and road-mending, and the publication of the most useful of these essays is promised at an early date. Such a book ought to prove of great value just at this time if the state is to inaugurate anything like a general improvement in its highways. The initial expense will, of course, be considerable, but it is believed that the state will have ample funds to meet the townships and counties in competition. That these improvements will pay for themselves in a few years there can be little question. In a recent number of the Philadelphia *Inquirer*, which contains a clear statement of the whole project, there appears a quotation from a paper read before the State Board of Agriculture by Mr. S. R.

Downing, one of its members, in which he shows that if drainage and repairs to the roads are made at the proper time, it will save each tax-payer under the present system from twenty-five to fifty per cent. of road taxes. This means that the present labor tax is enormously wasteful. The cost of maintaining the average township road in the eastern counties of the state is estimated at $1,500, of which $1,200 are spent in wages for work done late in the spring, to suit the convenience of farmers, after gulleys have been deepened and much destruction has been allowed by this neglect. It is further shown that four men by draining and filling at such times as their work is needed could keep the same roads in repair by eight months' work at a saving of $410—that is, a land-holder who pays $20 road tax under the present plan would save $6.75 under the cash plan, or if the service lost to the farmer is added, the total waste will be more than $10 out of every $20 of taxes paid.

Bad roads are expensive roads; improper maintenance is a shameful extravagance; in too many instances the men who are paid for repairing roads should in justice be fined for obstructing them. Any revolution in law or practice which will ensure to our people such roads as are common throughout Europe will materially lessen the expense and add to the comforts and pleasures of country life.

The North Woods Thirty-six Years Ago.

WE chanced not long ago upon a book called "Hills, Lakes and Forest-Streams, or A Tramp in the Chateaugay Woods," written by S. H. Hammond, and published in 1854. The author's name is not now familiar, and his work has no great literary interest, being a simple account of a summer outing, written by a man who evidently enjoyed Nature and a wild life keenly, but had no desire to collect statistics of any sort or describe the scenes he saw in anything more than a general way. But his words have, incidentally, great documentary value, as proving how short a time it has taken to bring the Adirondack woods into their present condition of semi-ruin.

"If," he says in the preface, "the reader will lay before him a map of the counties of Clinton, St. Lawrence, Franklin and Essex, and, beginning at the Chazy Lake, run his eye thence along to Bradley's Lake, then to the Chateaugay, then west to Ragged Lake and Indian Lake and so down through the series of small lakes to the St. Regis and then to the Saranacs, and down along again through three small lakes to the Racquette River, and then down that beautiful water-course to Tupper's Lake and to Long Lake, ... he can trace out a circle of some 200 miles in circumference enclosing natural scenery the most wild and romantic, lakes and rivers the most beautiful imaginable. I was out there several weeks in the woods, along the streams and floating on those beautiful lakes, and saw during that time no face of a white man save that of my guide." In short, when this book was written all this "broad sweep of country containing millions of acres was a perfect wilderness." That was only thirty-six years ago. What is this country now? From Upper Chateaugay Lake, only a few miles south of the St. Lawrence, where the banks have been wholly stripped of trees by the charcoal-burners, to the southernmost limits of the area described, devastation has made its way—here total, there as yet but partial, but everywhere sufficiently apparent to mean distress to the eye of the lover of Nature, and imminent danger to the mind which knows the value of our water-courses and their intimate dependence upon the forests of elevated regions. Thirty-six years ago the traveler had to construct his own canoes on lakes where now tourists swarm by the hundreds, where the railway whistle may be heard, and where the lumberman and charcoal-burner are ubiquitous, an axe in one hand and a torch in the other. Ignorance, carelessness and greed have worked hand in hand during the life of one generation only, yet the wreck they have wrought no statistician can compute and centuries of the unfettered ministration of Nature could not undo.

When we read of the primeval Adirondack forest in those old journals, where the experience of the first missionaries is embalmed, we do not think of it as a possession which once was ours. It seems to have belonged to far-off ancestors for whose ill deeds we are not responsible, and whose aims and methods, we fondly fancy, were inferior in intelligence to our own. But when we see that this primeval forest stood intact thirty years ago we begin to realize our responsibility for past sins, and, which is still more important, we gain a fresh sense of future danger. Such agencies as have been active in this forest do not carry on their work in simple arithmetical progression. If a certain amount of damage is done during one year, the next year will see, not a similar, but a vastly greater amount. If thirty years have accomplished the ruin we now behold, thirty more years, with the same agencies at work unchecked, will more than suffice to sweep the Adirondack forests off the face of the earth—to put them in the same category as those so-called forests of England, where to-day sees only wide wastes of underbrush and an occasional isolated Oak or Beech. A letter from an American traveler which we read last summer described a drive in the south of France near Nimes which, according to the map, traversed a "forest" for miles and miles. "We could not exactly agree about it when the day was over," said the writer; "my wife insists that the forest contained seven trees; but she is an optimist by nature—I only counted six." This sounds like farce, but it is simple truth. And if present methods of procedure remain unchecked there will certainly be vast districts of Adirondack forest which, thirty years from now, a traveler may truthfully describe in a similar way.

The Autumn Flora of the Lake Michigan Pine Barrens.—III.

THOUGH the Sunflowers have mostly disappeared from the barrens, two of them are still found upon the ridges, *Helianthus divaricatus* and *H. occidentalis*. The former has a rough stem and leaves, and rather small flowers. The latter has an odd appearance for a Sunflower, by reason of its leaves being mainly near the root, the stem being nearly naked above, giving to it a scape-like aspect. It is not seen in as great numbers as the former.

Of Prenanthes, three species may be found in favorable localities. Among the low bushes in the richer ground *P. altissima* and *P. alba* are not uncommon, and in considerably drier localities *P. racemosa*. In the companion genus, the common Hawkweed for September, is *Hieracium Canadense*, growing like most of its kind in the dry grounds.

Two Polygonums may be deemed specially characteristic, both small and of slender but erect habit, with slender branches and very narrow leaves. They are *Polygonum tenue* and *Polygonella articulata*. *Polygonum tenue*, though rarely more than a foot in height, has long, simple branches more or less provided with small white flowers. The Polygonella is commonly of about the same height, but is sometimes taller. Since the leaves become disjointed and fall off it has a naked look. The erect branches are abundantly furnished with small, but yet showy flowers, as they are often very bright colored. In the barrens they vary much in color. The tints run from red through rose and flesh color down through pale pink to white. Some years white will be the predominating color, or white tinged with pink; in other years white will scarcely be found, the rose shades characterizing the flowers. Those which appear latest in the season seem to have the brightest colors. Both plants succeed in the driest locations, where the sands may, at the time they are in bloom, bear few plants besides them.

Lobelia Kalmii continues to blossom in the damp sands during the early fall, the smooth and slender stems showing a spike of pale blue but delicate little flowers. In the adjoining dryish ground will be seen specimens of *Buchnera Americana*, a taller plant, with an erect stem, generally without branches. It is a rough plant, and has a spike of small but deep blue flowers raised above the sparse grass amid which it is apt to grow. But it, like the Lobelia, is more characteristic of the late summer flora.

A papilionaceous plant yet persists in flower by the shore of the lake, though in other localities in seed or beyond that stage. It is our most common Prairie Clover, *Petalostemon violaceus*. The dense spikes of violet flowers, though much less abundant, are as complete as they were earlier in the season. It is established everywhere upon the sand ridges, and its foliage of fine and pretty leaflets keeps fresh and green till late in autumn, yielding only, like Artemisia, to the hardest frosts. Its form and habits, especially when close to the shore, are quite different from what it takes in the grassy prairie, where its natural home is deemed to be, and where it is single-stemmed, or nearly so. But in the sands it strikes downward with a strong, branching root, sometimes nearly an inch in diameter at the crown, the size corresponding to that of the plant. From this root rise several stems (the most I ever counted, twenty-six), forming a roundish bunch that may measure a

foot and a half across. Having this habit, few plants when it is in full bloom on the nearly naked sands are more striking than this mass of violet color. It crowds down to the shore nearly as far as the waves will let it, and attains its greatest vigor on the lakeward side of the ridge of sand which skirts the water. If the same effects could be reached by cultivation it would be a very ornamental plant both from flowers and foliage. The sand is almost purely siliceous, being carried away by car-loads for use in the best masonry as the "sharp lake sand" of the architect and builder. But this sand, at least near the surface beside the shore, is not devoid of organic matter, though in such a finely divided condition as to mostly escape detection by the eye. But dead fish and vegetable matter are continually washed ashore, and their decay must furnish nourishment to plants which grow where they have lain. They have plenty of room in which to grow, and from their location are supplied with considerable moisture, both by capillary action from the saturated sand below them and by the moist air rising from the neighboring waters. Besides, the free play of the winds around the plants and their exposure to abundant light, almost dazzling as reflected from the sand in the full blaze of the sun, doubtless have much to do with the symmetrical grouping of the stems. In fact, this roundish or bunch-like habit, and this tendency of plants to throw out several stems from a common root, is characteristic of several others near the shore, which grow there exclusively or crowd down to it from stations farther off, where they may be nearly or quite single-stemmed, and such illustrations of this may be instanced as *Prunus pumila*, *Cnicus Pitcheri*, *Solidago humilis*, *S. nemoralis* and *Artemisia Canadensis*. The plants are not crowded, each has plenty of room, and, like trees in the open fields, they freely develop in all directions, the forces acting on them being in equilibrium.

Another lingerer from the summer may still be seen in considerable quantities upon the ponds during a week or two of September—the White Water Lily. The only one I have detected here is *Nymphæa reniformis*.

It is now the proper season of another showy plant, *Physostegia Virginiana*. Its natural home is in rather moist and usually grassy ground. It has an ample spike of long flowers, with an inflated, trumpet-shaped tube. They are pale rose, more deeply colored on the upper side by darker lines, and stand out horizontally from the stem with gaping mouths. In the bud these form four rows, one on each side of the square stem, but as they expand they turn toward the sun so that the spike is at length one-sided. It is a very smooth plant, with thick, dark green leaves, and is handsome throughout.

Some of the Dodders continue in flower, attracting attention by their tangle of orange-colored, thread-like stems, bearing numerous clusters of pale or colorless flowers of a delicate cellular texture. *Cuscuta Gronovii* and *C. glomerata* are the principal ones. The former is parasitic on herbs and small shrubs in damp, shaded locations, the latter almost always on *Compositæ*, especially Golden-rods, in more open situations. In the fruiting stage it is conspicuous for the rope-like coils around the stem of the host-plant, made by the dense and continuous masses of globular capsules.

Growing among the low shrubs, beside the sloughs and in the moist land a tall Thistle is common, *Cnicus muticus*. It has long and slender branches, ending in a handsome, middle-sized head of bright purple flowers. The viscid scales of its compact and shapely involucre are not the least notable of its features. Its leaves are few and distant, its peduncles long and naked. When it attains a height of five or six feet, as is often the case, raising the many heads of flowers far enough above the shrubs to obtain a background of green from the stunted Pines near at hand, it presents a pleasing picture, and this Thistle will not be despised or soon forgotten when seen in its native settings.

Some tall Grasses now in flower on the sand ridges must not be overlooked. They are *Andropogon furcatus*, *A. Virginicus* and *Chrysopogon nutans*. The first is about three feet high, the last two usually from four to six feet. All are of a glaucous green hue, and provided with long, narrow leaves. The two taller are the most striking in appearance, the culm of the Andropogon ending in a diffuse panicle of digitate spikes, feathery, with white, silky hairs; that of the Chrysopogon in a graceful, oblong panicle, with shining, russet brown hairs. Though the stands of the Chrysopogon are distant from each other, and the Grass is scattered along the open ridges, there are enough of them to give character and animation to the scene, especially when the tall stems are waving in the wind. As an ornamental Grass in the Pine-barrens, this "golden bearded" one takes precedence of all that grow there at any season of the year. Another curious Grass is met with more commonly on the higher ridges, being particularly characteristic of the thinly wooded dunes, *Aristida tuberculosa*. It is but ten to twenty inches high, and is remarkable for its flowers bearing three long awns twisted together at the base and widely divergent above. As they point every way, when in fruit the stem has a kind of chevaux de frise look from whatever side it is approached.

I have noted only the more striking features of the autumnal flora of the Pine-barrens. It is one of the four periods into which the season of flowers may be divided, noticeable changes occurring so as to distinguish them from each other. A kind of pause takes place, and then a different set of plants flourishes, giving to the flora quite a distinct facies. These appearances and changes are evidently due principally to variations in heat and moisture. The four periods may be called that of spring, from the opening of the season till about the 1st of June; the early summer, lasting from four to six weeks from the close of the former; the summer, continuing through the warmest and usually driest part of the year, the season of occasional showers, and ending about the last of August; the autumnal, or remainder of the year, as described in these articles.

Englewood, Chicago. *E. J. Hill.*

Basket-Work of the North American Indians.—I.

PROBABLY the most generally diffused handicraft among our Indian tribes is that of basket-making in its various forms; it is that which subserves the most useful purposes, and in which they have acquired most skill. This native art, at first simple and rude to meet the requirements of savage and nomadic life, has been steadily growing and improving and has attained remarkable ornamental developments.

The collection of native basket-work in the National Museum is exceedingly interesting in the number and diversity of its types, a mere enumeration of which is only admissible here: dishes and plates, bowls, roasting-trays, jars and water-bottles, mats, wallets, wall-pockets, hats (often of exquisite pattern), hoods for pappooses; baskets, of forms innumerable, to winnow seeds, carry luggage, store grain, keep fruit, etc.

The interest of the botanist is naturally aroused in the material used by the various Indian tribes in their basket-work. I have been enabled to determine a large proportion of the plants thus used in North America;* many others, of which I have no knowledge, are doubtless likewise employed, and perhaps some of the readers of GARDEN AND FOREST will kindly contribute additional information on the subject, so that the list may be made as complete as possible, even to the extent of including the material used by civilized people.

Let us begin with Grasses. In a valuable paper by Dr. O. T. Mason in the Report of the National Museum, 1884, we read that the natives of the Aleutian Islands make their mats and baskets "of the fibre of the Elymus treated as hemp," and that the marvelous nicety of this grass-weaving is worthy of all praise. The species of Elymus referred to are *E. mollis*, *E. arenarius* and *E. Sibiricus*. The "Wild Wheat" basket-material of the Chilkaht Indians may be one of these.

A Sporobolus is mentioned in the same paper as used by the Tule-River Indians of California, but there seems to be no species of that genus, in that locality, suitable for the purpose; it is not unlikely that *Vilfa depauperata* is meant, a plant with long, filiform and flexuose culms, much sought after by Mexicans for stuffing their large leathern aparejos, a purpose to which its toughness and elasticity specially adapt it ("Botany of California," ii., 267).

The Cane (*Arundinaria macrosperma*) of the southern states furnishes the principal material for the basket-making of the remnants of the Cherokees, Choctaws, Creeks, Chickasaws and Seminoles. The Choctaws specially excel in its use, and their little baskets, variously colored, are offered for sale in several southern cities.

The New England Indians, especially the Penobscots, make an extensive use of the Holy Grass (*Hierochloë borealis*). Its long radical leaves become strongly involute in drying, forming flexible threads, which are braided into fine strips, and these are woven into baskets and other pretty fancy work. I have also found braids of Holy Grass in a camp of the Crow Indians on the Yellowstone, but did not learn how they were used. The delicate and lasting fragrance of the dried leaves gives them an additional, and perhaps not their least, merit.

Other Grasses, species of Spartina, Calamagrostis, etc., suggest themselves as particularly suitable where length,

* My grateful acknowledgments are due Dr. C. E. Woodruff, U. S. A., for much interesting and valuable information concerning the Hoopa and Klamath Indians, whose basket-work, in variety of forms and perfection of finish, is probably not excelled in the country.

toughness and flexibility of culms are the chief requirements, but I have no knowledge of their having been used.

In a study of the subject one first thinks of Osiers or Willows as the ordinary and proper material, but it is well known that our Willows do not possess the softness and pliability which make several species of so much economic importance in Europe; even when cultivated in this country these species become woody and hard. From all the information within my reach, I am led to believe that the native Willow most used in this country, at least west of the Rocky Mountains, is *Salix sessilifolia*. From the region of the Hoopa and Klamath Indians of northern California and southern Oregon, to that of the Papagos of southern Arizona, this plant furnishes one of the best materials for the warp of basket-work. Young shoots two or three feet long are cut in the spring or early summer, stripped of their bark and dried; they are soft and remarkably flexible, sometimes quite tenuous, almost filiform. This species deserves attention as one most worthy of cultivation for the production of valuable osier. In order to keep it well pruned down and provoke new growths of young, tender shoots the Indians of northern California set fire to the woods, an operation likewise intended to improve the Hazel-nut, another highly esteemed basket-plant.

Other native species of Salix are, or have been, used, such as *S. cordata, S. sericea, S. petiolaris* in the eastern and middle states, the last two of real value; *S. lasiandra, S. lasiolepis* and *S. lævigata* in the western and Pacific states. Of the last named only the roots are used by the Hoopa and Klamath Indians.

Dr. E. Palmer states (*Amer. Nat.*, 1878) that along the Colorado River a Willow, not specified, yields an abundance of long, soft bark from which the Indians make rope, twine, sandals and mats. Willow-bark is also used by the Tule-River Indians of California.

Most species of Poplar have soft, pliable and tolerably tough rootlets well adapted to the requirements of basket-making. Those of *P. trichocarpa* are much used, entire or split, by the Indians of northern California for the brown work of the woof of their hats and baskets. Whoever has seen the petticoats, made of the inner bark of the Cottonwood (*P. Fremontii*), worn by the squaws along the Colorado River, must have realized the possibility of utilizing the same material, as well as that of the allied species, *P. monolifera*, in the manufacture of many household utensils.

The rootlets of Alder (*Alnus rhombifolia*) and probably others furnish brown threads much esteemed by the Indians of California and Oregon.

The young flexible twigs of the California Hazel-nut (*Corylus rostrata*, var. *Californica*) are almost in as great demand by the Indians of California and Oregon as the branches of *Salix sessilifolia*, these two plants making up most of the warp of their basket-work. Hazel-nut-twigs are also much used in binding fish-dams.

One of the best known basket-plants is the Trefoil Sumach or Squawberry (*Rhus aromatica*, var. *trilobata*), a shrub widely distributed from the Missouri through the Rocky Mountains to the Pacific. It is one of the chief materials of the Apaches, Navajos and other tribes in southern California, Arizona, Utah and New Mexico. The twigs are soaked in water, scraped and then split. The baskets are built up by a succession of small rolls of grass, over which the twigs are firmly and closely bound; according to Dr. E. Palmer, they "are very durable, will hold water, and are often used to cook in, hot stones being dropped in until the food is done" (*Amer. Nat.*, 1875). I am informed that the Poison Ivy of the Pacific coast (*R. diversiloba*) is also a basket-plant, but it is quite possible that this species is confounded with the preceding.

The Indian Hemp (*Apocynum cannabinum*) has a strong fibrous bast easily stripped off, and from which many tribes from the Great Lakes to the Pacific, but specially those of the Great Basin, have from time immemorial made rope, lariats fishing lines, bags, mats, baskets, belts, etc.

The Sioux Indians, I believe, never practiced the manufacture of any but the coarsest kind of basket-work, and in this the bark of the Elm (*Ulmus Americana*) takes a prominent part. The Red-Osier Dogwood (*Cornus stolonifera*), so abundant in their country, is not used in basket-work so far as I know, notwithstanding its pretty purple, osier-like shoots. It is, however, stated by B. S. Barton that the young shoots of an allied species, *C. sericea*, were formerly used to make coarse baskets.

Of vines, the California Grapevine (*Vitis Californica*) should be noted; its stems, slender, flexible and strong, make good ropes and may be twisted into various household articles. The Supple-Jack (*Berchemia volubilis*) also suggests itself in this connection.

Fort Buford, N. Dak. *V. Havard.*

New or Little Known Plants.

Clematis paniculata.

THIS is a stout, vigorous plant with long, climbing, woody stems, which is widely distributed and very common in nearly all parts of Japan, and occurs also in central and northern China. It is allied to our common Virgin's Bower and to the European *Clematis Flammula*. The leaves are long-petioled and are composed of three ovate, pointed leaflets, obliquely cordate at the base, with entire margins and prominent veins. The flowers are produced in long axillary panicles; they are white, fragrant, one and a half inches across, with narrow, obovate, acute sepals. They begin to open toward the end of August and continue to appear for nearly a month, being succeeded by heads of fruits furnished with long, plumose, silvery tails which are almost as ornamental as the flowers.

*Clematis paniculata** was discovered by Thunberg, the Swedish botanist, who resided in Japan from 1773 to 1779. It is stated by Nicholson in "The Dictionary of Gardening," on what authority I do not know, as this species is not mentioned in the second edition of Aiton's "Hortus Kewensis," that it was introduced into England in 1796. Its early introduction is possible, as, according to Maximowicz, it was figured by Houltyn, a Dutch author, whose work on woody plants, to which I have not access, was published toward the end of the last century. But whether this Japanese plant was introduced early into European gardens or not, it has certainly never made any great figure in them, and I can find no portrait of it in any of the principal horticultural or botanical periods. It was included, however, in the catalogue of plants cultivated by Monsieur Lavallée in his Arboretum at Segrez, and three years ago I found it in the garden of the Paris Museum.

Clematis paniculata was probably introduced into the United States by Thomas Hogg through the Flushing nurseries, as it was received at the Arboretum thirteen years ago from Mr. Parsons. It has also been sent by the Agricultural College at Sapparo and by James Veitch & Son, of London, under the name of *C. Flammula robusta*, and by Spath, of Berlin. The credit of making this fine plant known in American gardens is due, however, to Mr. Edward O. Orpet, at one time foreman of the Hardy Plant Department in the nurseries of Woolson & Co., of Passaic, New Jersey. "When I came to Passaic," Mr. Orpet writes, "there was an old plant there which had been brought originally from Japan among other plants, and every September it was a grand sight. It did not always ripen seed, and cuttings would not root unless taken in heat in the spring. I at once thought that grafting might be tried, and as *C. Virginiana* grew wild in quantities in the neighborhood, this suggested itself to me as a substitute for *C. Vitalba*, used by the English growers as a stock for the garden varieties of Clematis. I tried a few; the plants took easily, were potted in six-inch pots, planted out in May, and by September had grown ten feet high, with numerous shoots which flowered right down to the ground-level.

"So much for *C. Virginiana* as a stock, but I soon found that it was hard work taking out the roots from the swamps where it grows, and as we had a number of plants of *C. Stans* in the garden I tried this, and the stock (root only) united with the cion in two weeks; and the plants made far better growth from the first. Even the large-flowered Clematises do much better when grafted on *C. Stans*, the callus being much more readily formed than when *C. Vitalba* is used. Roots the thickness of a Wheat-straw are the best, and when grafted the plants should be planted in small pots and plunged in sand in a grafting-case or a frame."

* *Clematis paniculata*, Thunberg, *Trans. Linn. Soc.*, ii., 337.—Miquel, "Prol. Fl. Jap.," 139.—Franchet & Savatier, "Enum. Pl. Jap.," i., 1.—Maximowicz, "Mél. Biol.," ix., 595.—Franchet, "Pl. David.," 12.—Forbes & Hemsley, *Jour. Linn. Soc.*, xxiii., 6.

C. crispa and *C. Virginica*, Thunberg, "Fl. Jap.," 239 and 240. "C. Vitalba e. Japonica, Houltyn, 'Houtkunde,' i. 55, f. 2."

Clematis paniculata is an ornamental plant of great value. It is vigorous and very hardy; it grows rapidly, and flowers later in the season than the other species which resemble it, and at a season when few woody plants are in flower. The fruit is very handsome and retains its beauty until winter, and its foliage turns to rich colors in late autumn. The plants sent to the Arboretum as *C. Flammula robusta* are sometimes killed back in severe winters, and are less hardy than those raised from seeds gathered at Sapparo. It is from one of these that Mr. Faxon has made the drawing which is here reproduced. *C. S. S.*

SOBRALIA SANDERÆ, Rolfe, is a very handsome species introduced from Central America by Messrs. F. Sander & Co., of St. Albans. The flowers are larger than in *S. leucoxantha*, and without the orange markings in the throat, but paler and somewhat smaller than in *S. xantholeuca*. The segments are three and a half inches long and pale sulphur-white, with the throat of the lip of a bright clear yellow.—*Gardeners' Chronicle*, November 1st, p. 494.

CATTLEYA LINDENI is a beautiful form allied to *C.* × *Hardyana*, and probably a natural hybrid between *C. gigas* and *C. Dowiana aurea*. The sepals are pink, the petals lilac-rose with lighter veins, while the lip is very rich crimson, with two

Fig. 82.—Clematis paniculata.—See page 620.

New Orchids.

ANGRÆCUM HENRIQUESIANUM, Rolfe, is a very neat and pretty little species from the island of St. Thomas, West Africa, which flowered in the Botanic Garden of the University of Coimbra, Portugal, during 1889, and at Kew during the present year. It is closely allied to *A. bilobum*, but is a much smaller plant in every respect.—*Gardeners' Chronicle*, October 25th, p. 466.

CIRRHOPETALUM MASTERSIANUM, Rolfe, is an elegant little Cirrhopetalum introduced from the Dutch Indies by Messrs. Linden, L'Horticulture Internationale, Brussels, during the present year. It is allied to *C. gamosepalum* of Griffith, a species probably not in cultivation. The flowers are buff, variously marked with reddish brown, and with a purple-brown lip. It is described and figured in *Lindenia*, vol. vi., p. 33, t. 245.

lateral yellow blotches in the throat. It was exhibited by Messrs Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on October 28th last, when it received an award of merit.—*Gardeners' Chronicle*, November 1st, pp. 507, 508.

MASDEVALLIA O'BRIENIANA, Rolfe, is a tiny little species about two or three inches high, which appeared in the collection of Mr. R. I. Measures, of Camberwell. It is closely allied to *Masdevallia simula*, but has much larger flowers, which measure half an inch in length. The flowers are light yellow, spotted with maroon, and very pretty.—*Gardeners' Chronicle*, November 8th, p. 524.

ONCIDIUM LEOPOLDIANUM, Rolfe, is a noble and handsome Oncidium, introduced by Messrs. Linden, L'Horticulture Internationale, Brussels. It belongs to the Cyrtochilum section, and is allied to *O. corynephorum*, Lindl. The peduncle is said to

attain a height of several metres, and to bear as many as 300 flowers, which are white, with a purple disc to the sepals and petals, and a violet-purple lip. It is dedicated to His Majesty, Leopold II., King of the Belgians.—*Gardeners' Chronicle*, November 15th, p. 556.

Cattleya O'Brieniana.—A plant of this was exhibited at a meeting of the Royal Horticultural Society on November 11th last by Messrs. F. Sander & Co., of St. Albans. It is said to have light purple sepals and petals and a lip with crimson splashings. From a flower which I have seen I suspect it to be a pale form of *C. Harrisoniæ*.—*Gardeners' Chronicle*, November 15th, p. 556.

Odontoglossum Davivierianum, Rchb. f.—A supposed natural hybrid between *O. maculatum* and *O. nebulosum*. It was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on November 11th last, when it received an award of merit.—*Gardeners' Chronicle*, November 15th, p. 570, and 22d, p. 602.

Odontoglossum Noezlianum.—"A dwarf, delicate-growing novelty, with small, circular, bright scarlet flowers." It was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on November 11th last, when it was awarded a botanical certificate. I have not seen it.—*Gardeners' Chronicle*, November 15th, p. 570, and 22d, p. 602.

Sophro-Cattleya × Calypso, Rolfe, is a beautiful hybrid raised by Mr. Seden for Messrs. James Veitch & Sons, of Chelsea, from *Sophronitis grandiflora*, fertilized with the pollen of *Cattleya Loddigesii*, var. *Harrisoniæ*. The sepals and petals are of a brilliant rose-purple, much like those of the Sophronitis in shape, while the lip, which much resembles the pollen parent in shape, is light yellow, passing into pink on the margin of the side lobes, and into deep yellow on the base of the front lobe, the apical half of which is crimson-purple.—*Gardeners' Chronicle*, November 22d, p. 588.

Kew. *R. A. Rolfe.*

Cultural Department.

A Winter Lettuce Crop.

THE accompanying illustration, taken from a photograph, shows a section of a crop of Lettuce which is now (December 8th) maturing in the forcing-houses of the Cornell Experiment Station. It was grown primarily to be used for one of a series of experiments to determine the influence of the electric light upon various plants. Owing to a delay in establishing the light, no study of this kind will be made until the succeeding crop, but it still serves admirably to illustrate a successful method of culture.

The crop is a remarkably even one, not a single plant being missing from the bed, which is sixty feet long. There are two varieties shown in the picture, the plants upon the right half being the Tennis Ball or Boston Market, and those upon the left Landreth's Forcing Lettuce. In this crop the latter variety has surpassed even the old and popular Tennis Ball, while growing side by side with it and under precisely the same conditions, the heads being somewhat darker in color, and uniformly larger and heavier.

The seed was sown about the 1st of October in shallow seed-boxes or "flats," and transplanted two weeks later ten by twelve inches apart into the soil upon the benches. As with other forcing crops, the arrangement of the beds is a matter of considerable importance. In this house, constructed for various experiment purposes, the steam pipes are beneath the benches, an arrangement which is not essential for a Lettuce-crop, and in order to moderate the bottom heat the benches were double-boarded. To provide for drainage a layer of clinkers from the ash-pit was first placed over the boarding about an inch in depth. This was succeeded by three inches of roughly broken compost, consisting of two-thirds partially decayed sods and one-third stable manure, the whole being then covered by three inches of mellow garden soil, thus making a total depth of seven or eight inches upon the benches. With such a body of soil the conditions as regards moisture may be made approximately the same as those of out-door culture. If the soil is much shallower than this, it is constantly liable to become dried out as well as too warm, with a consequent check to the growth of the plants.

In forcing Lettuce it must be borne in mind that it is a comparatively hardy plant, which thrives best in a temperature which would be far too low for most of our forcing crops. In this case the effort has been to maintain a temperature at night of fifty degrees, and by day of ten to fifteen degrees higher. Of the two chief hindrances in the forcing of Lettuce, mildew and the aphis, the former has not made its appearance, and the latter has been held in check by frequently burning tobacco-stems, lately as often as two or three times a week.

About two weeks before the maturing of the crop provision was made for a succeeding crop by again sowing seed in the flats, and as soon as the beds are cleared the space will be at once filled by the seedlings now growing for that purpose. When every day's growth of a crop is made at the expense of burning many pounds of coal, it is manifestly of the highest importance that the crop should be pushed to maturity as rapidly as possible and the strictest economy of time and space be studied in providing for their succession.

Cornell University. *C. W. Mathews.*

Begonias.

THE cultivation of Begonias would seem to be a trite subject, but one finds among friends but limited collections of these desirable plants, and perhaps a few notes of interesting varieties may prove helpful to novices. There are said to be over 300 species of Begonias, and, of course, hybrids innumerable. With their widely divergent forms and habits, they are of great interest, and one could busy himself at all seasons collecting and cultivating this genus alone. Few plants of such easy culture are so satisfactory in bloom and so readily grown into specimens, and there is a constant change of interest as the various sections come into season. During the winter the greenhouse may be kept gay with handsome foliage and graceful flowers of many herbaceous kinds, of *B. Socotrana* and of hybrids of the tuberous section. In early spring the various tuberous species and hybrids will commence to move and make ready to replace the winter bloomers, which may be plunged in the borders to regain vigorous health. One pleasing point about most herbaceous kinds, which small growers will appreciate, is that such plants as one may have no room to cultivate may be kept nearly dormant at any time by cutting them down and keeping them nearly dry and pot-bound. For the greenhouse and conservatory decoration, fancy-leaved kinds will be found desirable, a few of the Rex varieties possibly, and those of distinct and striking form and leaf structure. Perhaps the most useful of fancy-leaved Begonias is the well known *B. metallica*, as this not only forms a handsome plant, but furnishes a larger supply of foliage suitable for cutting than perhaps any other variety. Clementina, a hybrid between a form of *B. Rex* and Diadema, is an excellent new variety, with characteristics of both parents, a handsome and vigorous grower. Diadema and Sceptra are two attractive varieties, with rather palmate-like, deeply cut leaves and silver markings.

B. Verschaffeltii, *B. ricinifolia maculata* and *B. Sunderbruchii* are three forms with large, deeply cut leaves on long foot-stalks, which are distinct and effective for decoration. They bloom in summer. *B. rubella* is also a distinct and desirable kind of similar habits. Its large, bronzy red leaves are thickly dotted with black spots.

B. Scharffiana, a new species, is a beautiful plant with large massive leaves on thick, fleshy red stems. The leaves are bright emerald green on the upper and deep red on the under side. The whole plant is covered profusely with short hairs. One feature of this plant is the refined beauty of the young leaves as they push out from the delicate greenish white scapes in which they are first enveloped. My plants, though large and nearly two feet high, have not yet bloomed. They are said to have good-sized white flowers, but these can scarcely add to the ornamental character of this species. Of varieties with fine flowers and handsome foliage Gloire de Sceaux may have first mention—a vigorous variety with leaves of polished bronze and large racemes of rose colored flowers. Gloire de Jony and Madame Hardy are two fine hybrids of *B. subpeltata*, with large pink flowers and beautiful foliage, the former light olive green and with a metallic sheen dotted with silver, the latter dark wine colored, checkered and covered with a crimson pile. *B. Olbia* is a species which is indispensable, though the beautiful crystalline flowers are axillary and not prominent. Its delicate, finely veined leaves are deeply cut, a dull red beneath, and of an indescribable combination of metallic bronzy green and red above. The entire effect of this plant with its beautiful foliage and its white, thick, tapering stems is very distinct and pleasing.

Of the varieties chiefly valuable for their flowers, though more or less ornamental, perhaps the first place should be given to *B. Socotrana*, which is proving such a valuable plant to the hybridizer. This variety starts into growth in September from bulblets formed at the base of the old plant. Its leaves are deep green, round, depressed in the centre and recurved at the margin; the flowers are bright rose, one and a half to two inches across, and last for a long time. From this species we

now have a few winter-blooming tuberous kinds with showy flowers. John Heal and Adonis are the best known of these. The former is said not to be a good grower. Triomphe de Lemoine is a hybrid from *B. Socotrana* and is a vigorous variety. This has already been figured in GARDEN AND FOREST. *B. Socotrana* has also given a hybrid with *B. insignis* named Bijou, which I find is a satisfactory kind with twiggy stems, prostrate habit and bright magenta flowers. *B. incarnata* is an established favorite among the winter-flowering kinds, and the French have given us a few varieties of this varying in color of flowers. Of these M. Crousse, M. Choner, M. Ed. Pynaert and M. Vallerand are the best.

The Semperflorens type are perhaps the most useful Begonias for flowers, being, as implied by name, very free bloomers. The varieties of this are very numerous, and the flowers range in color from white, through pink to deepest carmine. Some of the most useful varieties are Elegans, Bruanti, Lucianæ and Bajocensis.

A strain with more vigorous, taller habit and larger leaves is *B. semperflorens gigantea*, very useful for back rows and producing large racemes of fair sized flowers. The best of these are Odorata (Dr. Nachtigal), Amelia, Rosea and Carminea.

Among the more striking of newer Begonias Paul Bruant is probably the best. A vigorous variety, with deep cut light olive leaves, with toothed edges and bearing a great profusion of light rose flowers in racemes. M. de Lesseps is in the way of Argentea guttata with larger, darker leaves. Of older varieties, Mr. Barker has already called attention in GARDEN AND FOREST to *B. manicata* and *B. manicata aurea* (the variegated variety), very useful kinds, which in mid-winter fairly burst into blossom with numerous racemes of small pink flowers. *B. Gibsoni*, of course, must be noted as quite indispensable with its rosy blooms partly doubled, and among a host of older favorites are Compta, with pink stems, satiny green leaves and a silvery tinge along the mid-rib; Decora, with dark green silver-marked leaves; Argentea guttata, which some one has called Angels' Wings; and its wing-like silver dotted leaves bear out the name very well. But space forbids even naming many established favorites whose various charms and strange forms make these plants so interesting. Among the varieties one may find kinds simulating in foliage other plants of widely divergent habits, and even an annual species, *B. Schmidtii*, self-sown seedlings of which are continually appearing in all available spaces. Their habits are nearly as diverse as their foliage. Among them are dwarfs and giants, plants stiffly upright and scandent, and all intermediate forms with strongly marked periods of growth and rest in many cases.

Every one who cultivates flowers has a few much appreciated Begonias and they are no novelties; but it would seem that a wider distribution of some of the kinds noted above would increase the interest of many growers whose attention had not been called to them.

Elizabeth, N. J. *J. N. Gerard.*

Lettuce in a Forcing-house.—See page 622.

Filmy Ferns.

THE exceptional interest and charm of the Filmy Ferns, both as objects of study and as ornamental plants, is generally recognized. Botanically they have always received considerable attention on account of their special structure, which differs so markedly from that of the rest of the Ferns that some authors have separated them into a sub-order. Their vegetative peculiarities are being specially studied by more than one botanist in England at the present time. Horticulturists are attracted to them by the elegance and delicacy of their fronds, and their cultivation is a special hobby with several amateurs, while a few of the species, such as *Todea superba* and the Killarney Fern (*Trichomanes radicans*), are grown among Ferns generally. There are, however, a considerable number of beautiful species, known to and cultivated by a few specialists, which are quite as easy to manage as those already named, and, in fact, may be grown under precisely similar conditions with the Killarney Fern and the New Zealand Todeas. It is probable that many have avoided Filmy Ferns from a belief that they could only be grown where conditions of a very special character were provided. This belief is supported by the miserable health of Filmy Ferns in many gardens where their cultivation is attempted. Failure in these cases is, as a rule, obviously the result of ignorance of two very simple, but vital, factors in the healthy growth of these plants—namely, moisture and ample drainage. Filmy Ferns detest lime; they should, therefore, be watered with rain-water. As a rule, they dislike watering overhead, although the atmosphere about them should be kept constantly saturated. They will not thrive if planted in heavy or close soil. Peat fibre and pieces of soft sandstone, or even a bare piece of sandstone alone, or a piece of soft Fern-stem, afford the most suitable material for their roots and creeping rhizomes to cling to. If they are to be grown in pots and covered with bell-glasses, then the whole of the pot should be filled with drainage, upon which a little mound may be built with peat-fibre and sandstone. The plants should then be fastened onto this by means of wooden, not wire, pegs. To water plants thus treated, dipping the pot up to the rim in water or pouring water over the bell-glass so that it will run down into the pot, answers very well. If a frame can be afforded for Filmy Ferns alone the preparation in regard to drainage and soil should be similar to that recommended for pots. The surface of the soil may be varied by raising some parts higher than others by the free use of sand-

stone. In watering the frame do not use a rose-nozzle, but pour the water from the spout of the can onto the stones or anywhere except on the leaves of the Ferns.

All Filmy Ferns require a subdued light at all times of the year. In a state of nature they are found only in very sheltered spots, often clothing the under surface of stones or fallen tree-trunks, always in positions protected from wind and the drying influence of sunshine. If the sun is allowed to shine direct upon them only for an hour or so in summer they become dried and shriveled beyond recovery. Some of the species, particularly Todeas, may be grown in positions where they would get a moderate amount of sunshine, but fine specimens cannot be produced by its means.

The temperature most congenial to Filmy Ferns when under cultivation has only recently been arrived at. A few years ago the general belief with regard to all Filmy Ferns except the Todeas, the Killarney Fern and New Zealand species was that they required a tropical temperature. The discovery that this was an error was purely accidental. The late Dr. Cooper Forster, who had grown a large collection of Filmy Ferns in a conservatory attached to his surgery in Grosvenor Street, related how, on his heating apparatus breaking down, he was forced to leave his plants to their fate. Instead of dying from the reduced temperature, as he expected, the majority of them displayed a vigor of growth and depth of color which told their own story unmistakably. Even pteridologists were incredulous of this story until they saw its proof in the health of the collection of plants in Grosvenor Street. It was plain enough that many of the species which hailed from distinctly tropical regions were much happier when under cultivation in England if the temperature for them was kept comparatively low. At the time of Dr. Cooper Forster's discovery the Kew collection was grown in a temperature which in winter never sank below sixty degrees nor in summer below seventy degrees. With the exception of a few species, which were either too precious to risk in an experiment or were perfectly happy in a stove temperature, the whole collection was removed to a cool fernery in 1885. In this house no fire heat is used except during winter, in frosty weather the thermometer often registering fifty degrees or even forty-five degrees. With scarcely an exception the whole of the plants have proved not only able to support this low temperature, but the growth has been uniformly better than it was when they were in a warmer place. Many of them are from tropical regions where it is scarcely likely that they would ever experience a temperature anything like as low as they enjoy when under artificial cultivation. The following list comprises all the species which thrive in the cool fernery at Kew:

Hymenophyllum æruginosum.
" *asplenioides.*
" *axillare.*
" *caudiculatum.*
" *chilœnse.*
" *ciliatum.*
" *cruentum.*
" *demissum.*
" " *var. minus.*
" " *var. nitens.*
" *dichotomum.*
" *dilatatum.*
" *flabellatum.*
" *Fosterianum.*
" *fuciforme.*
" *hirsutum.*
" *Javanicum.*
" " *var. cristatum.*
" " *var. flexuosum.*
" *lineare.*
" *Lyallii.*
" *multifidum.*
" *obtusatum.*
" *pectinatum.*
" " *var. superbum.*
" *polyanthos.*
" *pulcherrimum.*
" *rarum.*
" *scabrum.*
" *sericeum.*
" *tamaricifolium.*
" *Tunbridgense.*
" " *var. Wilsoni.*
" *valvatum.*
Todea Fraseri.
" " *var. Wilkesiana.*
" *grandipinnula.*
" *hymenophylloides.*
" *plumosa.*
" *superba.*

Trichomanes alatum.
" " *var. attenuatum.*
" *apiifolium.*
" *auriculatum.*
" *Colensoi.*
" *crinitum.*
" *depauperatum.*
" *digitatum.*
" *exsectum.*
" *Filicula.*
" *fœniculaceum.*
" *humile.*
" *lucens.*
" *maximum.*
" *membranaceum.*
" *parvulum.*
" *pusillum.*
" *pyxidiferum.*
" " *var. olivaceum.*
" *radicans.*
" " *var. Andrewsii.*
" " *var. Boschianum.*
" " *var. concinnum.*
" " *var. dilatatum.*
" " *var. dissectum.*
" " *var. Luschnatianum prolongum.*
Trichomanes radicans, var. Luschnatianum pulchrum.
Trichomanes radicans, var. Luschnatianum superbum.
Trichomanes reniforme.
" *rigidum.*
" " *var. elongatum.*
" *sinuosum.*
" *strictum.*
" *tenerum.*
" *trichoideum.*
" *venosum.*

Kew. *W. Watson.*

Ruellia macrantha is certainly one of the most ornamental of the many cultivated winter flowering Acanthads, but it is scarcely known in gardens. It is a native of Brazil, from whence it was introduced by Van Houtte in 1875 and figured in the *Revue Horticole* the year following. It forms a compact many stemmed shrub from a foot to two feet in height, with oblong-lanceolate bright green leaves six inches long. The flowers are produced singly in the axils of the upper leaves, and as many as six flowers are opened together on each shoot. The calyx is formed of five linear segments an inch long, and is subtended by a pair of oblong green bracts also an inch in length. The corolla at the base is in the form of a narrow tube about an inch long, then broadly campanulate with five ovate spreading segments. The length of the whole flower is three inches and it measures three inches across the top. The color is a rich purplish rose, very similar to that of *Bougainvillea spectabilis*. The flowers last at least a week when cut and placed in water. The plant is easily propagated by means of cuttings, and it grows freely in an ordinary stove. Other species of Ruellia which are useful as winter-flowering plants are *R. Herbstii*, with terminal clusters of tubular flowers colored magenta and lilac; *R. macrophylla*, with brilliant scarlet Salvia-like flowers; *R. affinis*, with an erect semi-scandent habit, large, dark green leaves and terminal clusters of salmon red flowers almost as large as those of *R. macrantha*. These plants formerly belonged to the genus Dipteracanthus, now merged in Ruellia. *R. macrantha* can be recommended as an exceptionally good stove-flowering plant.

Iris stylosa is a useful plant as a source of cut flowers in early winter. It is generally considered a shy bloomer, but when planted close against the south wall of a greenhouse it blooms profusely from October into December. At any rate, some plants obtained last year from a French nurseryman and planted in the same border with the Jacobæa Lily (Sprekelia) have been flowering freely since October, and are bearing good flowers now, notwithstanding the severe frost and snow of the past fortnight. *I. stylosa* is a native of Algeria, where it is common in the hedges. It has a creeping rhizome, evergreen narrow leaves, one and a half feet long; scapes about a foot long, one-flowered; each flower is nearly three inches across and colored a rich purple-blue, with a few lines of yellow on the falls. It has been in cultivation over twenty years. There are several named varieties of it, one with white flowers. It is described as a spring-flowering species.

Kew. *B.*

Clematis Stans.—This plant when in growth and covered with foliage would appear to belong to the same section as *C. Davidiana* and *C. tubulosa*, and has in fact been described as a white *C. Davidiana*. All three of the above plants resemble each other in having leaves like the Japan Anemones, but the likeness ends here. *C. tubulosa* has deep blue flowers, and *C. Davidiana* light lavender blue, both being hardy herbaceous plants, while *C. Stans* has white flowers and is a hardy shrub. This statement is made because *C. Stans* is often called a hardy perennial, which it is, but not a herbaceous perennial, as many are led to suppose. The plant grows three or four feet high, the main stems being woody, and they bear close resemblance to the wood of a Grapevine, being of the same color and thickness, while the leaves are always opposite, with plump buds at their base. The propagation of this Clematis is easily effected by means of the hard wood and the axillary buds. The shoots may be cut up into single eyes, as is done with the Grapevine, and when placed in sand in a propagating bench they will make callus and grow readily. Apart from the beauty of this plant, *C. Stans* is the best species from which to obtain roots upon which to graft other species of Clematis. It is well known that Clematis come slowly from seed, and consequently grafting is resorted to as a much quicker method of reproduction. We have tried the roots of several species, but none united so readily with the cion as those of *C. Stans*. The union was perfect in two weeks, and the ligature could be removed with perfect safety. This species has therefore a peculiar value not only as a decorative plant, and on account of the ease with which it may be increased, but because it is such a help in multiplying other species and varieties which without such a convenient stock increase but slowly.

South Lancaster, Mass. *E. O. Orpet.*

Dianthus plumarius semperflorens.—With regard to the origin of this plant, to which allusion has already been made on page 562 of this volume, Mr. Thompson, of Ipswich, England, writes that M. Alphonse Alégatière, of Lyons, France, obtained it by crossing the best forms of the florists' Pink (*D. plumarius*) with a Perpetual Carnation. He adds that the first lot of seed he obtained and distributed was the only one of any value,

subsequent supplies turning out to be ordinary Carnations of no value whatever. It will, perhaps, be remembered that Monsieur Alégatière was the originator of that excellent class of Tree or Perpetual Carnations, well represented by such varieties as A. Alégatière, Cardinal, Miss Joliffe and Souvenir de la Malmaison, which was so much improved by the late Mr. Charles Turner, of Slough, England.

Cambridge, Mass. *M. B.*

The Forest.

Value of Mountain Forests.—II.

ANOTHER important function of mountain forests is the production and maintenance of such conditions of the soil, water, atmosphere and scenery of the region as are highly favorable to human life, health and enjoyment. An evergreen mountain forest like that of our White Mountain region is a great natural sanitarium, one of the best and most effective in the world in its life-giving and health-restoring qualities. The destruction of forest-conditions over this region would distinctly shorten the lives of great numbers of persons. It would be a serious error to conclude that the sanitary influences of these mountain forests are important only or chiefly to persons already affected by disease. The millions of dwellers in cities all need a season of out-of-door rest and recreation in summer in order to maintain the physical and mental health and soundness which are essential to success in the work of life. Our New Hampshire mountain forest-region is a summer playground for the inhabitants of Boston, New York, Philadelphia and the great cities of the south and west. As their population increases our entire area of forests, lakes and streams will be needed for this purpose, and it will soon all be brought into use if its attractiveness is not destroyed by despoiling the woods and waters of their freshness and beauty. For the weariness and exhaustion of vitality which so often result from excessive activity in the crowded life of towns and cities there is no healing influence more effective than the silent unconcern of Nature amid the scenes and conditions of summer residence in a mountain forest-region.

FISH AND GAME PRESERVES.

As a part of this sanitary function of mountain forests, their value as natural preserves for fish and game deserves far more serious and intelligent attention than it generally receives. Some occupation is necessary for many persons who go to the woods for summer rest and recreation, and the pursuit of game and fish supplies both physical and mental conditions which are highly favorable and restorative. The slaughter of game of any kind for the mere sake of killing, and of delight in the quantity butchered, is not only unsportsmanlike; it is coarse and disgraceful, and should receive pronounced disapproval everywhere. But fishing and hunting, as pursued by civilized and orderly anglers and hunters, are legitimate and proper means of recreation. If the forests are destroyed there will soon be neither fish nor game. When the shaded brooks are opened to the sun the trout will disappear, and when the wilds are despoiled of their sylvan beauty and sheltered solitudes the hunter's delight in them will be at an end.

The value of mountain forests on account of the beauty and charm of their scenery is closely allied to the sanitary influences already mentioned, and beauty of scenery—in addition to its power to produce happiness, to awaken and nourish "vital feelings of delight," and because of this power—beauty of scenery has in modern times great economic value. Switzerland and Norway and other mountainous countries in Europe derive important revenues from their scenery, which attracts multitudes of visitors from all parts of the civilized world. New Hampshire is remarkable for having so much attractive scenery, so many beautiful landscapes distinct from each other, within a comparatively small area of country. In this respect it is unequaled in any part of the United States. Several millions of dollars are brought to the hands of our people every year by summer tourists and boarders, and yet the attractions of our mountain region are by no means fully developed. But these valuable revenues will be diverted to other parts of our country, and to Europe, unless our mountain forests and streams are protected and preserved.

THE UPPER COÖS COUNTRY.

The fertile valley land of the upper Connecticut River is now at its best. The hills on each side were, until a few years ago, heavily covered with valuable timber. Now they have all been lumbered over. This would not of itself do any harm. Timber should always be cut when it reaches its best condition. That is what it is for. But at many points in this Upper Coös country the steep slopes rising from the valley on each side have been burned over till the root-mat which held the soil in place is breaking up. The young people of our day are likely to live to see this rich upper Connecticut valley almost completely destroyed. The surface materials of the hills will be carried down more and more by the action of the water in the spring season, and will bury the soil of the valley under deposits of inert substances. There are already places on these slopes where trees will never grow again.

Both Connecticut Lake and Second Lake were formerly surrounded by woods, and the trees grew to the very edge of the water. In order to land, when rowing, a man had to push his boat up among the boughs of the trees and climb out on them, unless there was a landing cleared by the axe. The blue sky never bent over anything in Nature more beautiful than these mountain lakes of crystal clearness, with their miles of shoreline one continuous fringe and wall of green foliage. But Connecticut Lake has been dammed to raise the water to float logs. The back-water has killed the timber, and now all the lower portions of the shores are ghastly and repulsive tracts where the decaying tree-trunks are gradually dropping into the polluted water below. This destruction of the timber by the back-water was entirely unnecessary.

All the country around Connecticut Lake and Second Lake and between the two, and part of the way from Second to Third Lake, has been lumbered over. The timber is not all removed, and from a distance the forest still looks green, but in the woods the tangled mass of fallen trees and tree-tops is almost impassable.

The wilderness around Third Lake has not yet been disturbed. This lovely sheet of water is in the heart of a primeval and not easily penetrable forest, and the traveler is here companioned by the sources of the Connecticut River. The lake extends within a mile or so of the Canadian line. In the upper Connecticut valley men feel as if the world had just been made and given to them. They say, "Why, there's hardly anything *but* woods! We haven't begun on them yet." It seems to them as if the forests around them were inexhaustible, but the price of timber lands is advancing in every part of our country because business men have become aware that the White Pine supply of the upper Mississippi Valley is speedily coming to an end, and that everywhere our consumption of timber greatly exceeds the rate of growth. People are unwilling to think of the future, to recognize the conditions which will surround their children. Yet without such foresight the permanence of what we value most in our civilization is impossible.—*From the Report of J. B. Harrison, Commissioner of Forests for New Hampshire.*

Correspondence.

The English Sparrow.

To the Editor of GARDEN AND FOREST:

Sir.—I have read lately in the Journal of the French Société d'Acclimatation an account of the damage done in the United States by the English sparrow. It was a most unfortunate idea introducing into America these birds, always more destructive than useful, without introducing, too, their natural enemy, created, apparently, expressly to check their excessive multiplication. This enemy of the European sparrow, which it certainly would not be difficult to naturalize in the United States, is the pigmy owl known in France under the name of Chevêche, the *Stryx passerina* of Linnæus. He is a ferocious and well-armed bird, able from his small size to enter into small holes in walls or rotten trees, or wherever the sparrows make their nests. Although the Chevêche attacks rats and mice like the other species of Stryx, his specialty as a carnivorous bird is to destroy sparrows. He is not larger than a blackbird, although shorter and stouter. The short, strongly-armed claws of this bird permit him to climb up the face of a wall and to ascend and descend the cavities of old trees, into which he plunges without hesitation. This little bird inhabits, too, churches and all sorts of old buildings, and, in a word, all the out-of-the-way places which the other birds of the same genus seek. He is only partly nocturnal, beginning to hunt his prey at dusk. The Chevêche not only exterminates the sparrows' nests, but it drives them away entirely by its presence alone from any locality. Sparrows so fear this bird that whole flocks of them depart as soon as they notice that it is established in any particular region. This little owl to the sparrow is like the presence of a wolf in a sheep-fold.

It seems to me, therefore, that it would be an interesting experiment to try to naturalize this bird in America. In order to make the attempt successful, and this is true in all efforts to naturalize birds, there are certain conditions which must be

fulfilled; the most important is to procure for the strangers houses and retreats where they can find shelter and can rear their young in safety. Numerous laws have been adopted in France for the protection of insectivorous birds, although none of them have yet produced any very satisfactory results. And this must always be the case as long as people cannot be made to understand that birds need places of refuge in which to build their nests and breed without fear of being disturbed by man, or by dogs, cats and other destructive animals.

The stupid destruction of nocturnal carnivorous animals, like owls, bats, etc., is one of the great agricultural errors of our time, and it is safe to say that the enormous losses in crops due to rats, mice and various insects are largely in consequence of this error. Rabbits in Australia are ruining crops, and still they might be got rid of by introducing the great owl (*Stryx bubo*), the special enemy of rabbits, and other large carnivorous animals like eagles, which are not rare in the south of France. It is certainly astonishing in this era of progress that the world does not know better how to make use of such assistance as nature offers us free of charge.

Villa Thuret, Antibes. *Charles Naudin.*

Why Private Grounds Should be Enclosed.

To the Editor of Garden and Forest:

Sir.—The article on "Private Grounds in Cities and Towns" in your issue of December 10th prompts me to make a plea for enclosures, for the appearance of privacy in the grounds about a house, as the matter is in my mind every day as I look about my own neighborhood. I am glad that Mr. Baxter admits the "great charm in a 'close,'" but I regret that he treats it as almost an impossibility in this age and country, and wholly at variance with our habits and character, something to be relinquished with a sigh rather than to be sought and striven for.

I know nothing of landscape-gardening, and speak merely as a suburban dweller, accustomed to see his own small grounds and those of his friends from within and to look on the property of others from without, and to feel that from whichever point the usual surroundings of an American suburban house are looked at, their attraction depends chiefly on the extent to which they give an impression of privacy. It is true that a low, open fence of rails or palings gives little privacy, and, unless covered with vines, may be unsightly; but thick, high, graceful hedges, while grown less easily than in Europe, are possible with care, and should by all means be encouraged. A private lawn, be it large or small, with nothing to separate it from the public street, looks, to me, undressed and undignified.

Why is not the desire for privacy thoroughly healthy and sensible? So long as a man surrounds his property with nothing unsightly, his duty to the public is done. He cannot be called upon to share his grounds with them. We attach a great deal of importance to the idea of home, priding ourselves upon the home-loving spirit as something peculiar to our race. Who could take pleasure in a home with no front walls to the rooms, or with those walls of glass so that every passer-by could see all that was going on?—and yet why should the house alone be home, why should not the home idea include the grass and trees and flowers about a house?

Then, too, barriers, as was said in Garden and Forest last year (vol. ii., p. 193), give "the element of mystery, of surprise and expectancy, the impression and promise of something still before us and beyond what we can see, which may minister a fresh delight." Why should the public be refused the pleasures of imagination as to what may lie behind the hedge, and be given only the cold, hard facts of a small grass plat and a few regulation dwarf trees and stiff flower-beds?

I believe that the first step of most village improvement societies is to seek to remove whatever separates private grounds from the street. By this they cut at the root of that public spirit and that love of the picturesque which they seek to gratify and develop. No man will care much to make the village attractive who does not care to make his own grounds so; and how much is he likely to care about them when he regards them not as part of his own home, but merely as an adjunct to the street? Again, the desire to see into a neighbor's grounds, to enjoy his property without cost, regardless of how much his own use of it may be abridged thereby, is the very opposite of public spirit. These societies may do well to attack unsightly fences; but they should recommend something better in their place, and remember that the love of due privacy is not to be condemned, for it is generally found closely allied to the love of the beautiful and the love of nature.

Mount Airy, Philadelphia. *Charles C. Binney.*

Autumn Colors in Oregon.

To the Editor of Garden and Forest:

Sir.—In a contribution to Garden and Forest last year concerning the autumnal coloring of this region I failed to mention one of the most interesting plants of our western flora, the Azalea of the Pacific coast, *Rhododendron occidentale*, known here almost universally as the "Honeysuckle." This popular name has descended to it, doubtless, from its eastern cousins, *R. viscosum* and *R. nudiflorum*, which are commonly called by this name. It is a handsome shrub, quite abundant in many wooded districts. In others it is seen only now and then near the borders of streams, or sometimes forming handsome clumps in some neglected corner of the field. But, wherever seen, in the fall of the year its leaves glow with such a profusion of scarlet and crimson mingled with the gold and green, that it produces the most delightful effects, which are none the less pleasing, it seems to me, than those it produces when in full flower.

Prunus subcordata, the wild Plum of this region, should also have been mentioned. The wild Plum sometimes becomes a small tree, but is seen generally as a small shrub three to four or five feet in height. It often sets the whole countryside ablaze in the autumn with the abundance of its scarlet and crimson colors, mingled, of course, with red and yellow, and garnished with a sprinkling of green.

Just at this time (November 27th), however, most of our deciduous trees and shrubs are stripped of their foliage, only a few of the Cottonwoods and Alders, and sometimes the sprouts about the base of a felled Oak, still holding a portion of their leaves. But the Willows have been conspicuous for the past week or two by the bright yellow of their leaves. These flame out into the brightest of yellow colors just as the deeper and richer scarlets and crimsons and reds are about dying out. The Willows here rarely form trees, but grow mostly in great clusters of slender, wand-like stems, the younger sprouts being very handsome in the winter with the polished green and red of their bark.

But in the cultivated orchards many of the Pear, Peach and Apple-trees still hold their leaves. The Prunes and Plums and Cherries, however, are bare. I notice that the Periwinkle (*Vinca*), which our people here almost universally call "Myrtle," and a few other garden plants, are yet in bloom, with expanding flower-buds on late blooming Roses.

Wimer, Ore. *E. W. Hammond.*

Planting a Screen.

To the Editor of Garden and Forest:

Sir.—I have been wishing to plant as a screen and for variety some Staghorn and Glabrous Sumachs, and have hunted for suggestions as to the best method of transplanting to secure the best and speediest results. In early November I selected the best specimens I could find on the road-side and put them in rather poor and shallow soil. The specimens I selected were as tall as any I remember to have seen, the Staghorn certainly eight feet high, the other, I should think, four to five feet high. Then I had a thick mulch of coarse manure applied, and in December I contemplate cutting them down about one-third. Can you suggest any treatment better than this?

Wm. A. Jenner.

[The mulching and cutting back are good treatment. Perhaps smaller plants would have been preferable.—Ed.]

Sporting of Chrysanthemums.

To the Editor of Garden and Forest:

Sir.—The variable coloring of Chrysanthemums forms an interesting subject for speculation and research, and can hardly be studied too minutely. At least one or two features of this tendency to sport I have not seen mentioned in print. Several years ago I bought a single plant of Fair Maid of Guernsey, a white variety with almost globe-shaped flowers and finely quilled petals. Next season I raised several plants from the original one, and was surprised to notice that while some of them flowered after the fashion of the old stock, others produced a flat flower, with petals as broad and open as Elaine or Puritan. At that time I had but the single variety, and there were no other Chrysanthemum cultivators in the vicinity. The sporting apparently all occurred in one season, and the variation appears to remain true, though of that I cannot speak positively. The original plant from which all the others came is still in existence and has not changed its appearance. I have now marked several specimens of both forms and shall watch them carefully.

Two plants of the flat petaled form were left outside this fall till late in November, and both developed a rich purplish tinge on the lower side of the outer petals that was quite striking. From this fact and from the fact that Duchess, one of the most variable in coloring, is usually almost white when subjected to undue cold, it would appear that the state of the atmosphere has much to do with sporting. Duchess is also easily affected by poor light, becoming faint yellow instead of its usual "Zinnia red" color. It will doubtless be found that heat and light are together accountable for about all there is of the change of color in Chrysanthemums. But this does not explain the opening out of the petals of the Fair Maid of Guernsey.

Buffalo, N. Y. *J. C.*

Recent Publications.

The Forests of North America.—III.

Die Waldungen von Nordamerika ihre Holzarten, etc.

In the previous notices of this work (pp. 193, 200) special attention was given to that part of Dr. Mayr's work relating to the distribution of forests and the species of trees of which they are composed. There now remains another portion of the work to notice—that devoted to Fungus parasites. This part of Dr. Mayr's work, although it occupies but a comparatively small fraction of the whole, contains a number of errors and inaccuracies of statement which should hardly be allowed to pass without criticism. On pages 433, 434, the author enumerates thirty-four species of Fungus parasites, including two new genera and thirteen new species, although he expresses a doubt with regard to three of the latter. Besides the list to which we have referred there are notes and descriptions of some of the species of fungi scattered through the text.

If there is any genus of fungi found in the United States whose development has been more frequently and carefully studied than any other, it is probably the genus Gymnosporangium, and there seems no good reason why a foreigner writing on our fungi should not first read what has already been published in America as well as in Europe. Dr. Mayr cites *Roestelia lacerata*, Sow, on Cratægus as connected with *Gymnosporangium macrocarpum* on *Juniperus Virginiana*. But it is a well known fact, as shown by the cultures of Thaxter and confirmed by others, that the Roestelia in this case is not *R. lacerata*, Sow, but *R. pyrata* (Schw.) The name of the Gymnosporangium, moreover, is not *G. macrocarpum*, but *G. macropus*, Lk., first described by Schweinitz in 1822 under the name of *G. Juniperi Virginianæ*. The spelling cannot be considered a printer's error, for it is given as *macrocarpum* in the list and again incorrectly as *macrosporum* on page 195 and in the index. The author evidently has not studied with care the Gymnosporangia which abound in the United States, for on page 195, in speaking of *Juniperus Virginiana*, he says "Except *G. macrosporum*, which causes a witchesbroom distortion (Hexenbesen), the tree seems to have no enemies." The statement is incorrect in two ways. The witchesbroom distortion is not caused by *G. macropus*, which produces the familiar "Cedar-apple," but by a different species. Furthermore, *J. Virginiana*, far from having no enemies, is peculiarly susceptible to the attacks of fungi, and, of the genus Gymnosporangium alone, *G. macropus*, *G. globosum*, *G. clavipes* and one other species are common on that host.

The author records on leaves and shoots of Fraxinus an Æcidium, the species of which he considers to be in doubt. But why should there be any doubt? The species is one of the best known and most striking in appearance—*Æc. Fraxini*, described by Schweinitz in 1822. On the other hand, with regard to the new species which he calls *Rhytisma punctiforme*, the author has apparently no doubt; but, unfortunately, Dr. Mayr was anticipated by Fries, who described the fungus under the name of *R. punctatum* more than fifty years ago. There is cited on *Cornus florida* a *Microsphæra* (*Erysiphe*) *Corni*, n. sp., which is also figured under the name of *Podosphæra Corni*. As the figure apparently represents more than one ascus in a perithecium, the name *Podosphæra* was probably a slip of the pen; but the fungus, as far as can be told from the figure without a description, is the species described by Cooke and Peck as *M. pulchra*, and referred by some later writers to the older *M. Alni* (DC.), Winter, which is common especially on *C. alternifolia* and *C. stolonifera*. Certainly, without a differential diagnosis, one cannot suppose that *M. Corni* is other than the well known Microsphæra on Cornus, whatever view one may hold concerning the perplexing synonymy in this case.

Without stopping to consider other doubtful cases, it will be seen that Dr. Mayr is not well informed in the mycological literature of the United States; and that being the case, it is to be regretted that he has ventured to introduce into a work, in other respects valuable, so many new names for species of fungi, some of which have for years been well known to American botanists and others of which are doubtful. We can only agree with Von Tubeuf, who, in his review of the present work, *Bot. Centralbl.*, xli., 415, says that "the presentation of new genera and species in the absence of descriptions and adequate figures, the material itself being unripe or imperfect, is not to be approved or acknowledged."

The Golden Flower, Chrysanthemum, is an elaborately illustrated book, lithographed and published by Prang & Company, Boston. The text is not strictly horticultural nor botanical, although much that is interesting in the history of the flower is given. It consists in the main of a collection of verses from various poets, arranged and embellished with original designs by F. Schuyler Matthews, and the whole is illustrated with reproductions of water color studies by James and Sidney Callowhill, Alois Lunzer and Mr. Matthews. The verses have been selected with excellent taste, but the book is meant primarily to be a work of art, in which the national flower of Japan is successfully used in a general scheme of decoration which is Japanese in its motive. Some of the panels in which the poems are set are admirably designed, and Mr. Callowhill has added some of his best floral work in the portraits of the different Chrysanthemums. Of these, eighteen varieties have been selected for their distinctness and decorative qualities, and the reproduction of form and color has been very successfully accomplished. Kioto, one of the famous Neesima collection, is exceptionally well done; Medusa, although not a pleasing flower in our judgment, appears in its most characteristic form, and Lilian Bird, in spite of the fact that no artificial color can equal in delicacy the shrimp pink of the original, will please all who are acquainted with this singularly beautiful flower. Cullingfordii, Mrs. Wheeler and Golden Dragon are also well done, and all the flower portraits are much above the current work of this kind.

Altogether "The Golden Flower" makes a beautiful book for the holiday season, and is most creditable to all concerned in its preparation.

Notes.

According to the *Critic*, Joaquin Miller has abandoned literature for arboriculture, and has already planted more than 20,000 trees on his estate at Oakland, California.

The death, at Nancy, is announced of Antoine Auguste Mathieu, one of the most distinguished students of forests in Europe, formerly Conservator of Forests of France, Assistant Director of the Forest School at Nancy and the author of the well known "Flore Forestière de la France" and of other important scientific works.

Mr. T. S. Brandegee has lately returned to San Francisco from another exploring expedition in the southern extremity of Lower California. He found the season there favorable for botanizing on account of the abundant rains of the past summer, and interesting results from his observation may be looked for in an early issue of the *Proceedings of the California Academy of Science*.

Mr. C. G. Pringle has lately returned to his home in Vermont from a most successful botanical season in Mexico. He brings home with him a collection of 20,000 specimens, and will return again to Mexico as soon as these are distributed. Mr. Pringle's investigations the last year have been largely devoted to the little known region east of San Luis Potosí, where he has discovered many new species, a large proportion being trees and shrubs.

At a horticultural exhibition held in Buda-Pesth last spring a single firm exhibited 1,500 Roses grown in pots, many of them being standards. Among these last was a gigantic Maréchal Niel which measured ten feet in height and had a symmetrical head loaded with immense blossoms. A committee of ladies was appointed to pronounce upon the most beautiful variety of Rose exhibited, and their verdict gave the first place to Madame Charles Meurice, the second to Merveille de Lyon, and the third and fourth to Baron Adolphe Rothschild and Luciola.

Mr. R. Hector, of Placer County, California, told a convention of fruit growers at Santa Cruz that his famous Cherry-tree had brought him in a gross return of $1,800 in five years. Last year its yield was 300 ten-pound boxes, and an average

price of $1.50 a box has been received during five years. The tree is a Black Tartarian, thirty-five years old, sixty feet high, with a trunk which girths more than ten feet at a height of six feet above the ground. It stands in deep, rich sandy loam on bench land near the American River. The ground is irrigated each year immediately after the fruit, which matures very early in the season on account of the warm and sheltered location of the tree, is picked.

Under the heading "*Populus heterophylla, L.*," the editor of the *Bulletin of the Torrey Botanical Club* says: "Another locality for this rare tree in the middle states has been discovered by Rev. L. H. Lighthipe near Woodbridge, Middlesex County, New Jersey. The stations now known for it at the north, besides those given in my 'Catalogue of Plants for New Jersey' and its somewhat wide distribution on Staten Island, are Northport, Long Island, and Guilford, Connecticut, as recorded by Professor Sargent in his Forestry Report in the Tenth Census."

Herbaria were not common two centuries ago. Gibson, whose "Account of Several Gardens near London" was written in 1691, says of a Mr. Darby at Hoxton: "He has but a little garden, but is master of several curious greens that other sale-gardeners want and which he saves from cold and winter weather in greenhouses of his own making. . . . He is very curious in propagating greens, but is dear with them. He has a folio paper book in which he has pasted the leaves and flowers of almost all manner of plants, which make a pretty show and are more instructive than any cuts in herbals."

A correspondent of the *American Garden*, speaking of the many kinds of plants which are used for hedges in our southern states, says that one of the most beautiful for the purpose is the Gardenia or so-called Cape Jessamine. In the South Carolina garden where he saw it, "it flourishes in those parts of the shrubberies which lie on the edges of the Rice-fields, where it is valuable as being a handsome evergreen shrub which can stand water. During the spring freshets the family take to the canoes and are paddled between the rows of Gardenias, which hedge in a favorite walk, and which will emerge as green as ever from their bath of several weeks' duration. Even the smaller plants and cuttings do not object to a submersion which would kill the Magnolia and other native plants."

In his "Notes on England" the historian Taine has well expressed the difference between the type of garden developed in the south of Europe and that which owes its origin to England and has spread through all northern countries. For the inhabitants of the south, he says, a garden has always been a sort of open-air salon, the chief use of which is to provide a pleasant, convenient place for social intercourse. Thus, its formal, architectural design and artistic decoration with fountains, statues and balustrades is eminently appropriate; while, as the peoples of the north look upon a garden as a place in which to escape from men and commune with Nature, they have inevitably developed a style from which regularity and all other evidences of artificiality are banished in favor of arrangements which preserve or simulate the work of Nature herself.

A late bulletin from the New Jersey Experiment Station commends the potash salts as insecticides. It has been observed that farmers who use the muriate or Kainit in Corn-fields as a fertilizer have no trouble from wire-worms, white grubs or the Corn-root louse. Peach-trees have also been successfully planted in lice-infested orchards where all had formerly died by first treating the soil with Kainit. Professor Smith made some experiments of his own which substantiated the opinions of the farmers. He also tried solutions of the muriate and of Kainit for spraying, using one ounce to a pint of water in each case. The spray killed aphides on Wheat-heads and on Rose-bushes, and mealy bugs on greenhouse Camellias. In most cases the plants were uninjured, the Kainit inflicting damage more rarely than the muriate. Without further experiment these salts should be used with caution on foliage; but for underground species of destructive insects they should be tried whenever practicable. They have a high fertilizing value, and will help the plants to overcome insect injury by encouraging their growth as well as by destroying the insects.

Gotthelf Wilhelm Poscharsky, who held an honorable position among the landscape-gardeners of Germany, died recently at Dresden in the seventy-third year of his age. For many years he had been Court-gardener in that city, and to his labors as a cultivator added those of a designer in laying out some of the gardens attached to the suburban residences of the royal family. In his youth he had studied architecture under the famous Gustav Semper, and this preparation stood him in good stead when he turned his attention to gardening. Before his appointment as Court-gardener he had designed many charming private gardens in the outskirts of the town which now have been swept away to make place for solid lines of buildings. But every visitor to Dresden must remember the splendid avenue of Chestnut-trees which leads from the Neustadt to the Waldschlösschen restaurant, high on the northern bank of the Elb; and this will long remain a monument to Poscharsky, as he planted the trees with his own hands about forty years ago. The beautiful gardens in Chemnitz were also of his creation.

The Boston *Advertiser* asserts that Dr. Hale thinks he has found a possible solution of the mystery which hangs around the origin of the name of Rhode Island. "In his wanderings about the country regions he has found that the Rhododendron grows luxuriantly all over the island in its season, and he queries within himself whether the early settlers may not have made use of this fact in selecting a name for their habitation." It is probable that this curious query originated in the mind of some newspaper hack, rather than in Dr. Hale's. Aside from the fact that the Rhododendron is very rare in all regions north of New York, it is difficult to suppose that men of a turn of mind at once so unscientific and so unpoetic would have named an island after a flower. It is still more difficult than to accept the common theory that they named it from its fancied resemblance in shape to the Island of Rhodes in the Old World. But even in the highly improbable case that a flower inspired the choice of a name, it would more likely have been the Wild Rose, the "Rhoda" of the Greeks, than the Rhododendron or "Tree-rose," since the Wild Rose grows as prolifically in this region as the *Advertiser* asserts to be the case with the Rhododendron, which only grows now in one locality within the state of Rhode Island, namely Worden's Pond, and is not known to have grown at any time on the island of Rhode Island.

The International Agricultural and Forestry Congress, which was held in Vienna during the month of September last, attracted some 1,200 persons. Its most important feature seems to have been an address delivered by Chief Forest-Master Prosper Demontzey, of Paris, on "The Works of Reforestation and Stream Correction which have been undertaken in France since 1860." The speaker was most competent to discuss his subject, having himself been at the head of many of the works in question, and the facts and statistics he gave, as we find them reported in *Gartenflora*, are extremely interesting. To show the damage which may be done by streams which have become what the Germans call "wild" in consequence of the deforestation of the high lands where they rise, he described the catastrophe at St. Pous (Hérault), in September, 1875, when, in a few days, 150 buildings were swept away, more than 100 persons perished, and a damage of over 3,000,000 francs was suffered. Such disasters are now prevented by replanting the high lands, by turfing the banks of the streams, and by regulating with dams the flow of the water. Of course, to accomplish these ends strict and far-reaching legislation, as well as a great outlay of money, has been required. The government has the right to expropriate such lands as it sees fit, and to enforce the execution of needful work by private individuals, assisting them with premiums or subsidies. A certain amount of return for the outlay comes from the land reclaimed from the beds of "wild" streams, which is often admirably adapted to agricultural purposes. During the twenty-eight years covered by the speaker's descriptions (1861–1888) an area amounting to 145,000 acres had been replanted. Sixty thousand six hundred acres of this were state lands, 50,200 acres belonged to communes, and 34,200 to private individuals who had been subsidized by the government. Twelve and a half million francs had been spent in the purchase of lands, and 25,000,000 had been expended in actual work upon these and other government possessions. Six million francs had been paid out in subsidies and 8,000,000 for salaries and other general expenses. Of the 25,000,000 credited to "actual work" on government property over 7,000,000 were spent in planting, about 12,500,000 in controlling streams and more than 5,500,000 on accessory works, such as road and fence building. As a total we see that 51,500,000 francs—more than $10,000,000—have during twenty-eight years been spent by the French government in partially repairing the damage caused by just such a willful destruction of the forests as is going on to-day, with tenfold greater rapidity than ever in Europe, in almost every part of our own wide land.